MATH 776 - Spring 2017: Decision Theory and Bayesian Inference

# Syllabus

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| **Time** | T Th 1:00 - 2:15pm | **Location** | Hume 331 |
| **Instructor** | Dr. Xin Dang | **Office** | Hume 315 |
| **Phone** | 662-915-7409 | **Email** | xdang@olemiss.edu |
| **Office Hours** | MW 8:30 - 10:00 am<br>or by appointment | | |

**Textbook**: *Statistical Decision Theory and Bayesian Analysis, 2nd Edition* by James O. Berger
**Reference book**: *Bayesian Data Analysis* by A. Gelman, J. Carlin, H. Stern and D. Rubin

**Course Description**: This course introduces students to the terminology, concepts, and some fundamental ideas in decision theory and Bayesian statistics. Students will learn the differences between the Bayesian and frequentist approaches to statistical inference, how to approach a statistics problem from the Bayesian perspective, and how to combine data with informed expert judgment in a sound way. Students will learn the necessary theory to develop a firm understanding of Bayesian decision inference including point estimation, interval estimation, hypothesis testing and predictive inference. This course is to enable the students to apply decision theoretic and Bayesian techniques in solving decision problems and to provide a sufficiently mathematical treatment preparing students to pursue more advanced study in the statistical areas of decision theory and Bayesian analysis.

**Grading**:

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| Homework | 20% |
| Quizzes | 20% |
| Midterm exam (take home) | 30% |
| Final exam | 30% |

90%-100%= A, 75%-90%$^-$ = B, 60%-75%$^-$ = C,

**And Other Things**:

- Quizzes and Final exam are open notes, open book. Each quiz consists of one question, very similar to the homework.
- Six sets of homework will be assigned; some are graded and some are not. Either way, solutions for homework will be provided.
- I am here to help! Don't hesitate to ask questions in class, in my office, or via email.